ATTACHMENT 4: OCCUPATIONAL EMPLOYMENT PROJECTIONS, WAGE ESTIMATES, AND TRAINING REQUIREMENTS FOR ARIZONA

SOC Code	SOC Title	2003 Estimated	2013 Projected	Total Openings	Demand	Median Wage	Code	Description	Job Zone	Description	WORK KEYS	Applied Math	Applied Tech	Listening	Locating Info	Observation	Reading for Info	Team Work	Writing
Industry: Construction																			
47-2031	Carpenters	33,809	43,240	14,934	44.2 percent	$31,641	9	Long-term on-the-job training	3	Medium		4	3	3	4	4	3	4	4
47-2111	Electricians	10,648	14,595	6,052	56.8 percent	$37,280	9	Long-term on-the-job training	3	Medium		5	4	3	5	4	5	4	3
47-1011	First-Line Supervisors/Managers of Construction Trades and Extraction Workers	15,611	20,546	7,590	48.6 percent	$44,735	8	Work experience in a related occupation	4	Considerable		5	5	4	5	5	5	4	3
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	4,598	6,540	2,553	55.5 percent	$35,102	9	Long-term on-the-job training	3	Medium		4	4	2	5	4	4	4	3
47-2152	Plumbers, Pipefitters, and Steamfitters	8,581	11,449	4,841	56.4 percent	$36,128	9	Long-term on-the-job training	3	Medium		4	4	3	4	4	4	3	3

EXHIBIT A

SOC Code	SOC Title	2003 Est.	2013 Projected	Total Openings	Demand	Median Wage	Code	Description	Job Zone	Description	WORK KEYS	Applied Math	Applied Tech	Listening	Locating Info	Observation	Reading for Info	Team Work	Writing
Industry: Aerospace																			
11-9041	Engineering Managers	4,812	5,535	1,681	34.9%	$87,446	4	Bachelor's or higher degree, plus work experience	5	Extensive	N/A								
17-2011	Aerospace Engineers	3,967	4,315	1,330	33.5%	$74,073	5	Bachelor's degree	5	Extensive	N/A								
17-3099	All other drafters, engineering, and mapping technicians	2,055	2,393	833	40.5%	$48,202	6	Associate degree	n/a		N/A								
49-2091	Avionics Technicians	591	701	253	42.8%	$48,397	7	Postsecondary vocational training	4	Considerable	N/A								
49-3011	Aircraft Mechanics and Service Technicians	3,035	3,942	1,623	53.5%	$42,575	7	Postsecondary vocational training	4	Considerable	N/A								
51-1011	First-Line Supervisors/Managers of Production and Operating	8,126	9,659	3,287	39.8%	$41,118	8	Work experience in a related occupation	3	Medium		4	4	4	4	4	4	4	3
51-2011	Aircraft Structure, Surfaces, Rigging, and Systems Assembler	645	705	237	36.7%	$41,547	9	Long-term on-the-job training	3	Medium		3	5		5	5	5	3	
51-2023	Electromechanical Equipment Assemblers	685	681	162	23.6%	$30,707	11	Short-term on-the-job training	3	Medium									
51-4034	Lathe and Turning Machine Tool Setters, Operators, and Tenders	576	589	123	21.4%	$35,453	10	Moderate-term on-the-job training	3	Medium		3	4	3	4	3	3	3	3
51-4041	Machinists	4,154	4,726	1,540	37.1%	$32,088	9	Long-term on-the-job training	3	Medium		5	4	4	4	4	4	4	2

Applied Mathematics

Characteristics/Skills

There are five levels of difficulty. Level 3 is the least complex and Level 7 is the most complex. The levels build on each other, each incorporating the skills assessed at the previous levels. For example, at Level 5, individuals need the skills from Levels 3, 4, and 5. Examples are included with each level description.

Level	Characteristics of Items	Skills
3	• Translate easily from a word problem to a math equation • All needed information is presented in logical order • No extra information	• Solve problems that require a single type of mathematics operation (addition, subtraction, multiplication, and division) using whole numbers • Add or subtract negative numbers • Change numbers from one form to another using whole numbers, fractions, decimals, or percentages • Convert simple money and time units (e.g., hours to minutes)

Level	Characteristics of Items	Skills
4	• Information may be presented out of order • May include extra, unnecessary information • May include a simple chart, diagram, or graph	• Solve problems that require one or two operations • Multiply negative numbers • Calculate averages, simple ratios, simple proportions, or rates using whole numbers and decimals • Add commonly known fractions, decimals, or percentages (e.g., 1/2, .75, 25%) • Add up to three fractions that share a common denominator • Multiply a mixed number by a whole number or decimal • Put the information in the right order before performing calculations

Level	Characteristics of Items	Skills
5	• Problems require several steps of logic and calculation (e.g., problem may involve completing an order form by totaling the order and then computing tax)	• Decide what information, calculations, or unit conversions to use to solve the problem • Look up a formula and perform single-step conversions within or between systems of measurement • Calculate using mixed units (e.g., 3.5 hours and 4 hours 30 minutes) • Divide negative numbers • Find the best deal using one- and two-step calculations and then comparing results • Calculate perimeters and areas of basic shapes (rectangles and circles) • Calculate percent discounts or markups

Woodworth, LaDonna M

From: Martineau, Joseph (MDE) [MartineauJ@michigan.gov]
Sent: Thursday, July 03, 2008 10:16 AM
To: Alley, Roberta
Subject: RE: ACT implementation

Hi Roberta,

Please find embedded in this message a detailed per-student cost breakdown for the MME for each time the MME has been administered as well as projections for the next cycle.

Michigan Department of Education
Michigan Merit Examination Cost Per Student
As Of 7/3/2008

Test Cycle	Cost		Students Tested	Cost Per Student	
	Total	w/o Translations		Total	w/o Translations
Spring 2007	$ 9,561,537	$ 9,355,631	124,040	$ 77.08	$ 75.42
Fall 2007	$ 2,801,812	$ 2,553,631	27,891	$ 100.46	$ 91.56
Spring 2008	$ 9,669,840	$ 9,376,840	133,515	$ 72.43	$ 70.23
Spring 2009	$16,258,000	$ 15,646,618	140,000	$ 116.13	$ 111.76

Note: Costs for Fall 2007 and beyond are still being finalized. Cost for Spring 2009 is based on new contract pricing.

The Spring 2007 MME was the first administration. The Fall 2007 retest was more costly because of smaller volume. We have since cancelled the fall retest for a variety of reasons. Spring 2008 was again lest costly. We recently rebid the program because of significant cost increases for optional extension years. We came in under the optional extension costs, but not by much, for 2009 and beyond. $85 was an average across all administrations. We will be paying between $115 and $125 per student from 2009 and out.

--Joseph

-----Original Message-----
From: Alley, Roberta [mailto:Roberta.Alley@azed.gov]
Sent: Wednesday, July 02, 2008 6:42 PM
To: Martineau, Joseph (MDE)
Subject: FW: ACT implementation

EXHIBIT C

Sticker Shock

- Lobbying claims
  - ACT-based NCLB test will be
    - Less expensive
    - Better aligned to Michigan standards
    - Take less time to administer
- Reality
  - More than triple the cost
  - Requires significant augmentation
  - Takes significantly more time to administer

EXHIBIT D